

Passaic River Main Stem Flood Risk Management Project Preliminary Alternative Analysis Report

Public Information Session

25 March 2014 - Fairfield

27 March 2014 – Pompton Lakes

2 April 2014 - Lyndhurst



US Army Corps of Engineers
BUILDING STRONG



New Jersey Department of
Environmental Protection



Purpose of Meeting

- Review Background
- Provide an overview of the work performed during the last year on six alternatives that NJDEP & USACE agreed to reevaluate from the 1987 Feasibility Report
- Outline path forward
 - ▶ Public Meetings
 - ▶ Detailed Analysis (Phase 2)
- Obtain feedback on the three alternatives to determine public consensus and potential issues



Passaic River Basin Flood Facts

- April 2007 Flood - **\$792 million** in losses
- Mar 2010 Flood - **\$772 million** in losses (two flood events)
- Mar 2011 Flood - estimated **\$700 million** in losses
- Aug 2011 Irene - estimated **\$1 billion** in losses
- The occurrence of the 100-year flood (1903 flood equivalent) would result in over **\$2.24 billion** in damages
- Annual expected damages in the basin due to flooding are over **\$240 million**
- Eleven Federal disaster declarations since 1968
- Since 1900 – more than 26 lives lost & over **\$6 billion** in losses
- Since project authorization – over **\$3.5 billion** in losses

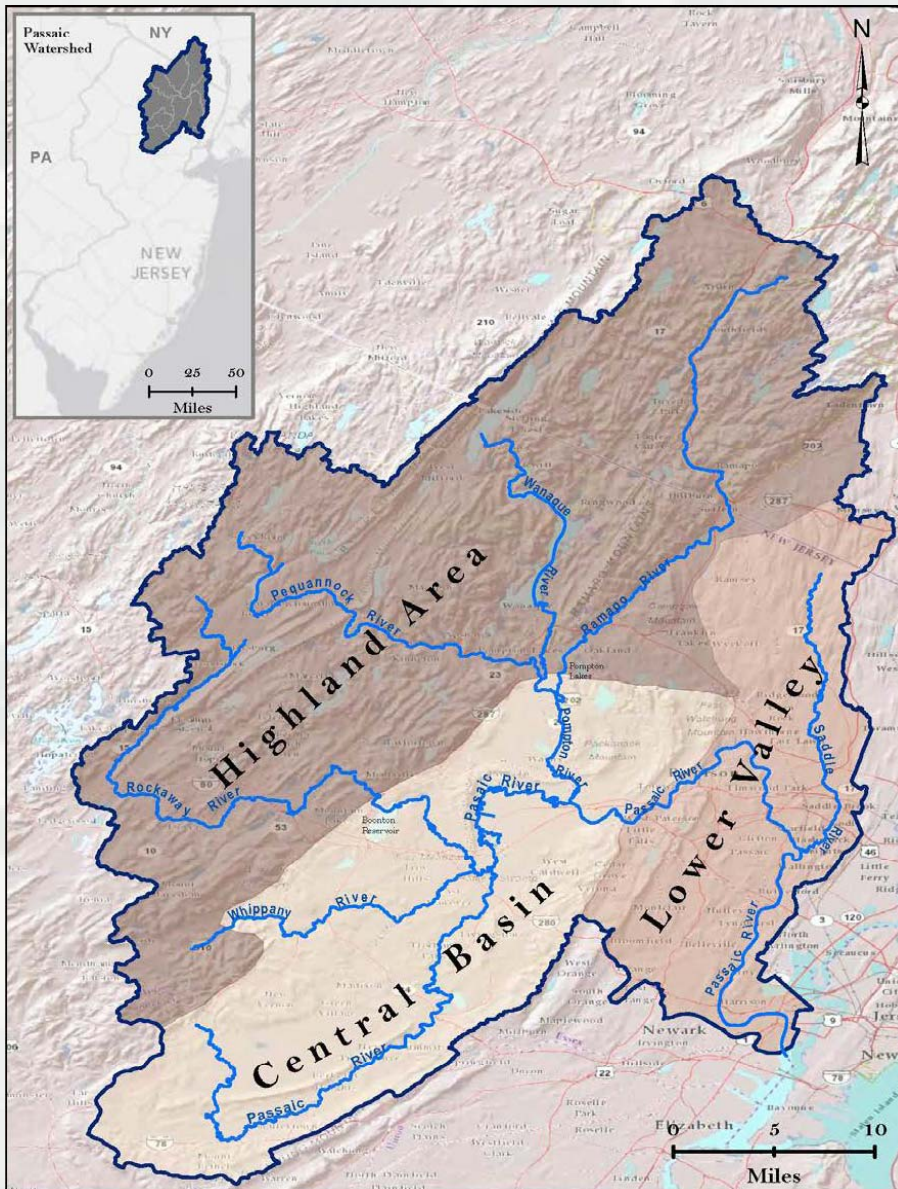


Passaic River Study Request

- Apr 2010 – New Jersey Governor creates Passaic River Basin Flood Advisory Commission through Executive Order 23
- Feb 2011 – Commission officially recommends reevaluation of the Passaic River Basin for long-term flood risk management as 1 of 15 recommendations.
- Mar 2011 – Letter from NJ Governor to Chief of Engineers that requests support of
 - Preservation of Natural Flood Storage Areas
 - Reevaluation of the Passaic River Main Stem Project
- Jun 2012 – NJDEP and USACE execute Cost Sharing Agreement, initiating Phase 1
- Sep 2012 – NJDEP and USACE Public Meetings
- Sep 2013 – USACE Submits Preliminary Alternatives Analysis Report to NJDEP
- Feb 2014 – NJDEP notifies USACE of three alternatives for Phase 2



Passaic River Basin Facts



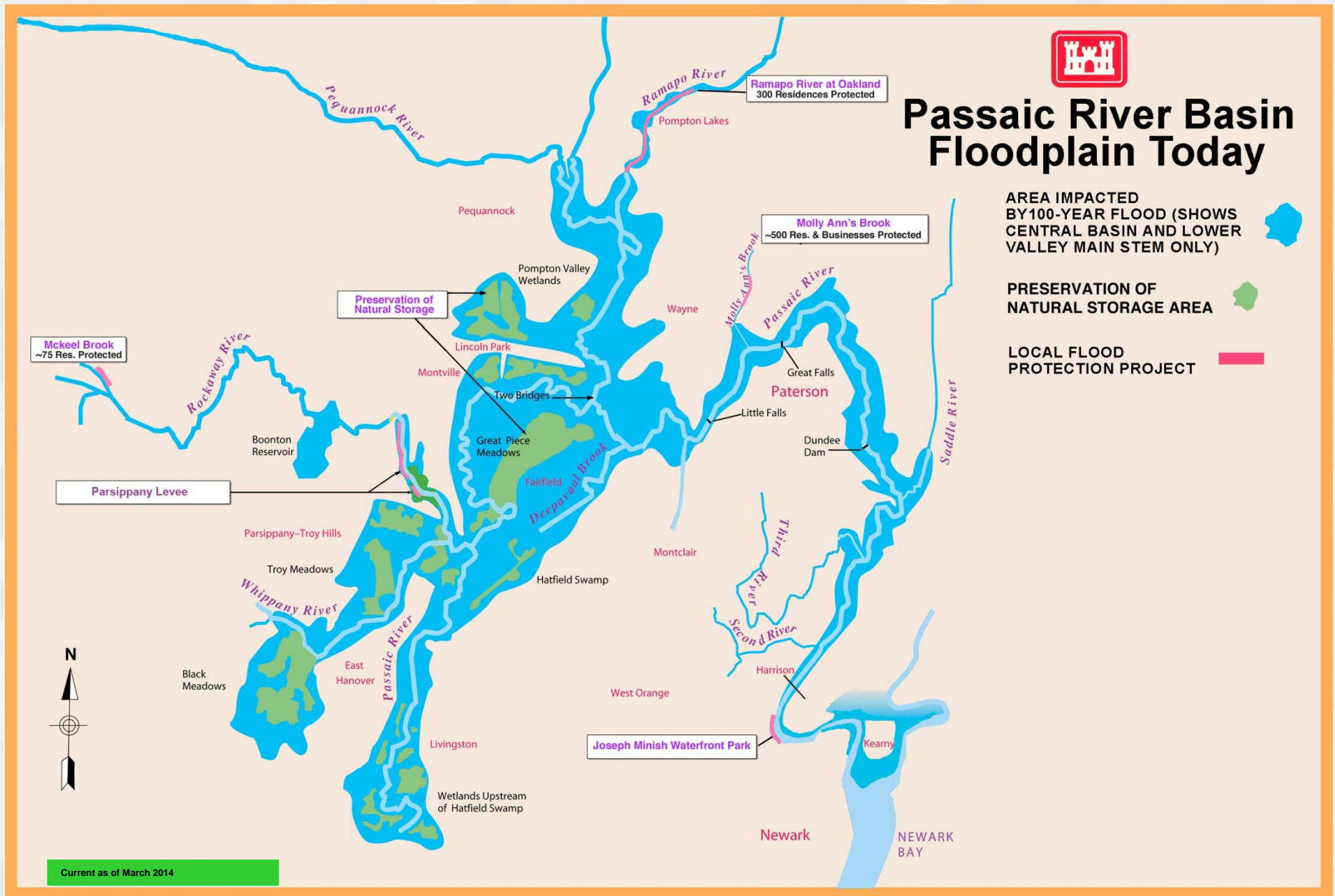
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- 935 square mile basin
- ~2.5 million people
- 20,000 homes, businesses, & public buildings in 35 communities in the floodplain
- Main Stem & major tributaries 100 year floodplain covers 40,000 acres (~60 mi²) of which half is fully developed
- One of the most densely developed floodplains on the eastern seaboard
- Extensive environmental degradation to river system coupled with significant repetitive flooding
- Eight Congressional Districts



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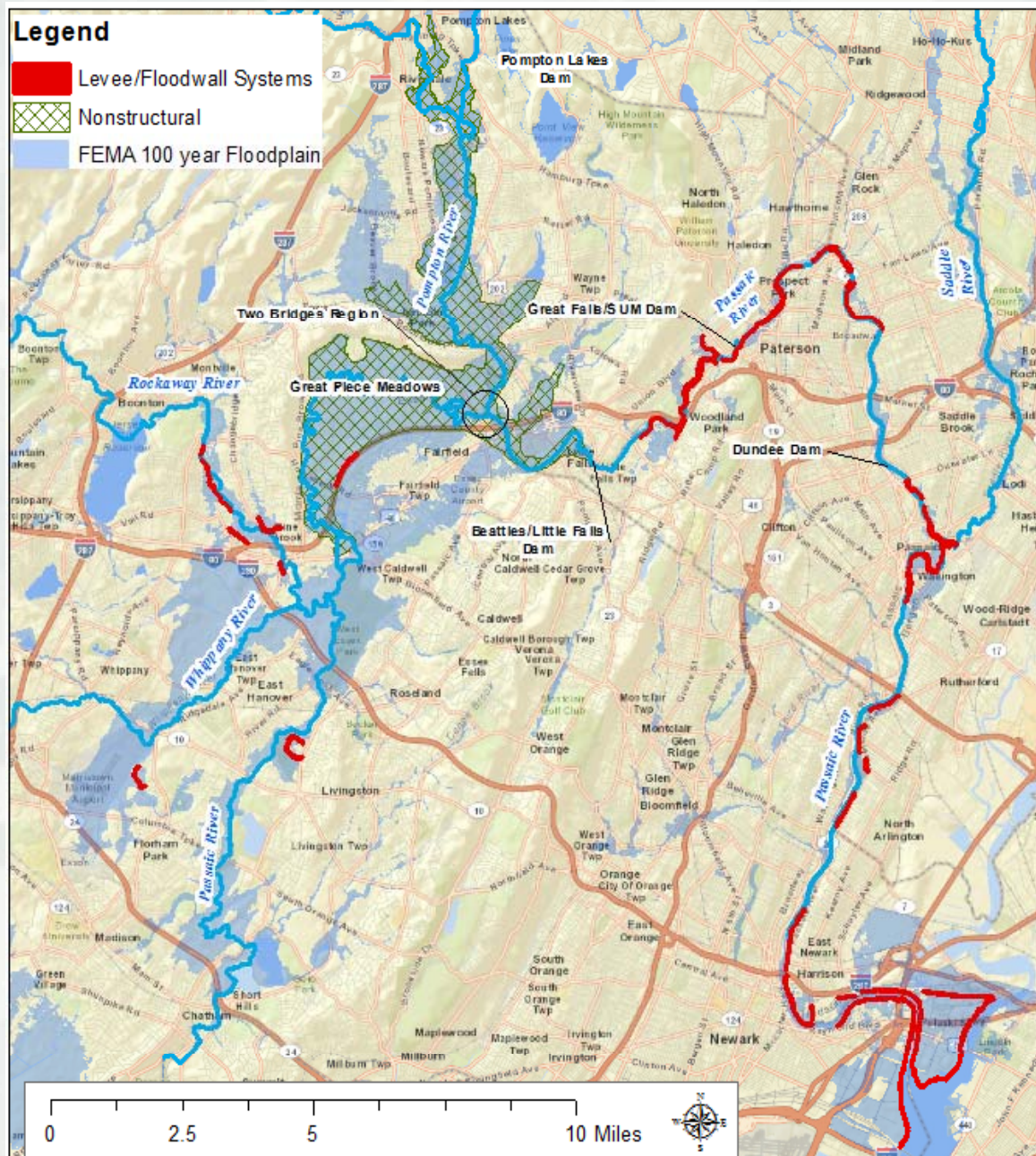
Passaic River Basin – Floodplain Today



Six Alternatives Jointly Agreed to be Reviewed in Phase 1

1. Levees and Floodwalls, 10-year Non-Structural
 - Alternative 14A from 1987
2. Channel Modification, Levees, and Floodwalls, 10-year Non-Structural
 - Alternative 16A from 1987
3. Flood Water Diversion Tunnel
 - Dual Inlet – Newark Bay Outlet Tunnel
4. Beatties Dam / Two Bridges Improvements
 - Plan requested by NJDEP in 2011
5. Nonstructural
 - 10 Year Flood, 1987 plan
6. No Action





Alternative 14A Levees, Floodwalls, and Non-Structural Plan

- 24 miles of levees
- 17 miles of flood walls
- 4,262 non-structural
- 0 miles of channel improvements
- 33 ponding areas
- 46 pump stations

Risk:

- 1% exceedance lower and upper basin (100-year)
- 10% exceedance highland & central (10-year)





Alternative 16A Channelization, Levees, Floodwall, Non-Structural Plan

- 16.5 miles of channel improvements
- 20 miles of levees
- 9 miles of flood walls
- 4,262 non-structural
- 31 ponding areas
- 22 pump stations

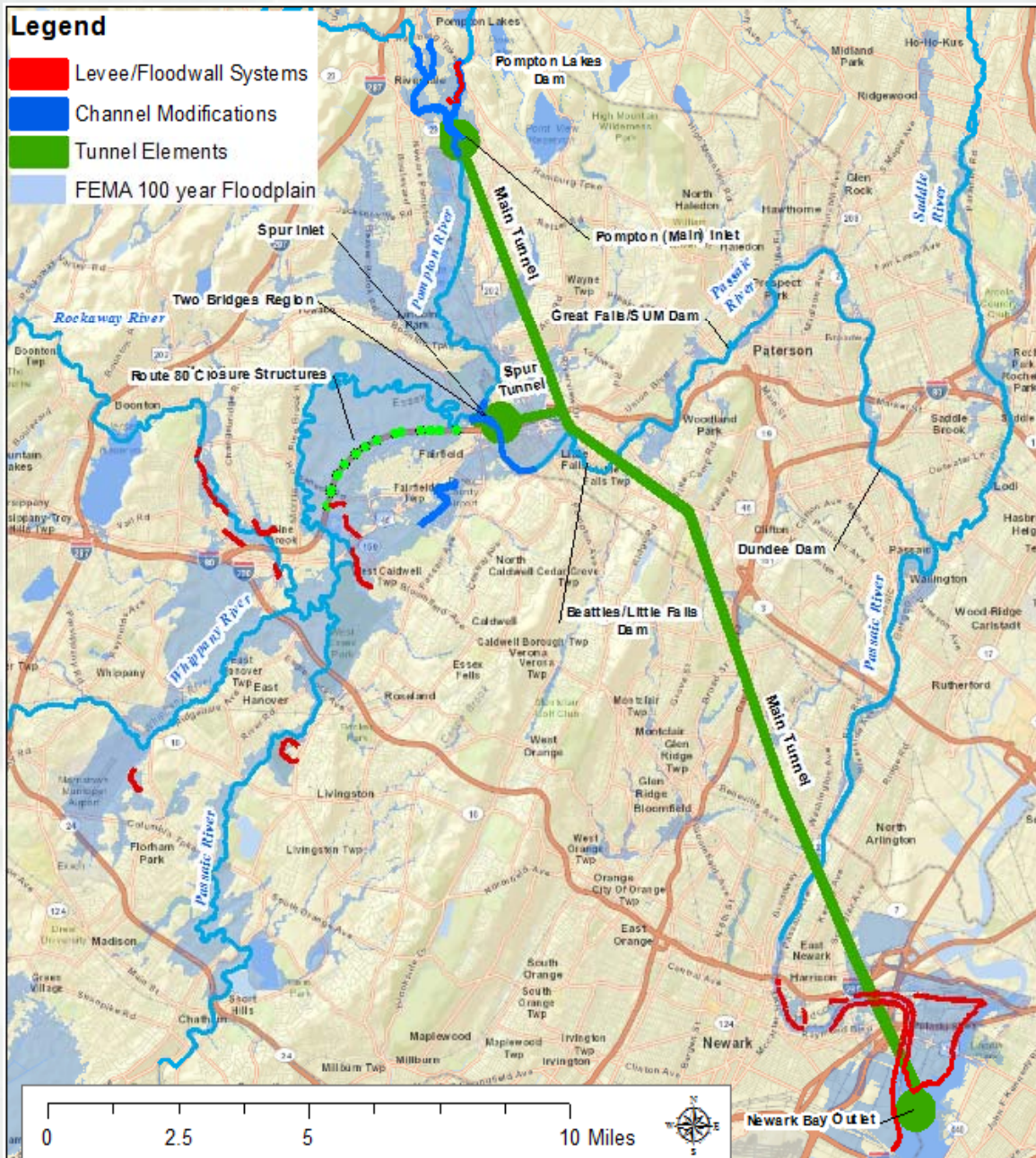
Risk:

- 1% exceedance lower and upper basin (100-year)
- 10% exceedance highland & central (10-year)



Legend

- █ Levee/Floodwall Systems
- █ Channel Modifications
- █ Tunnel Elements
- █ FEMA 100 year Floodplain

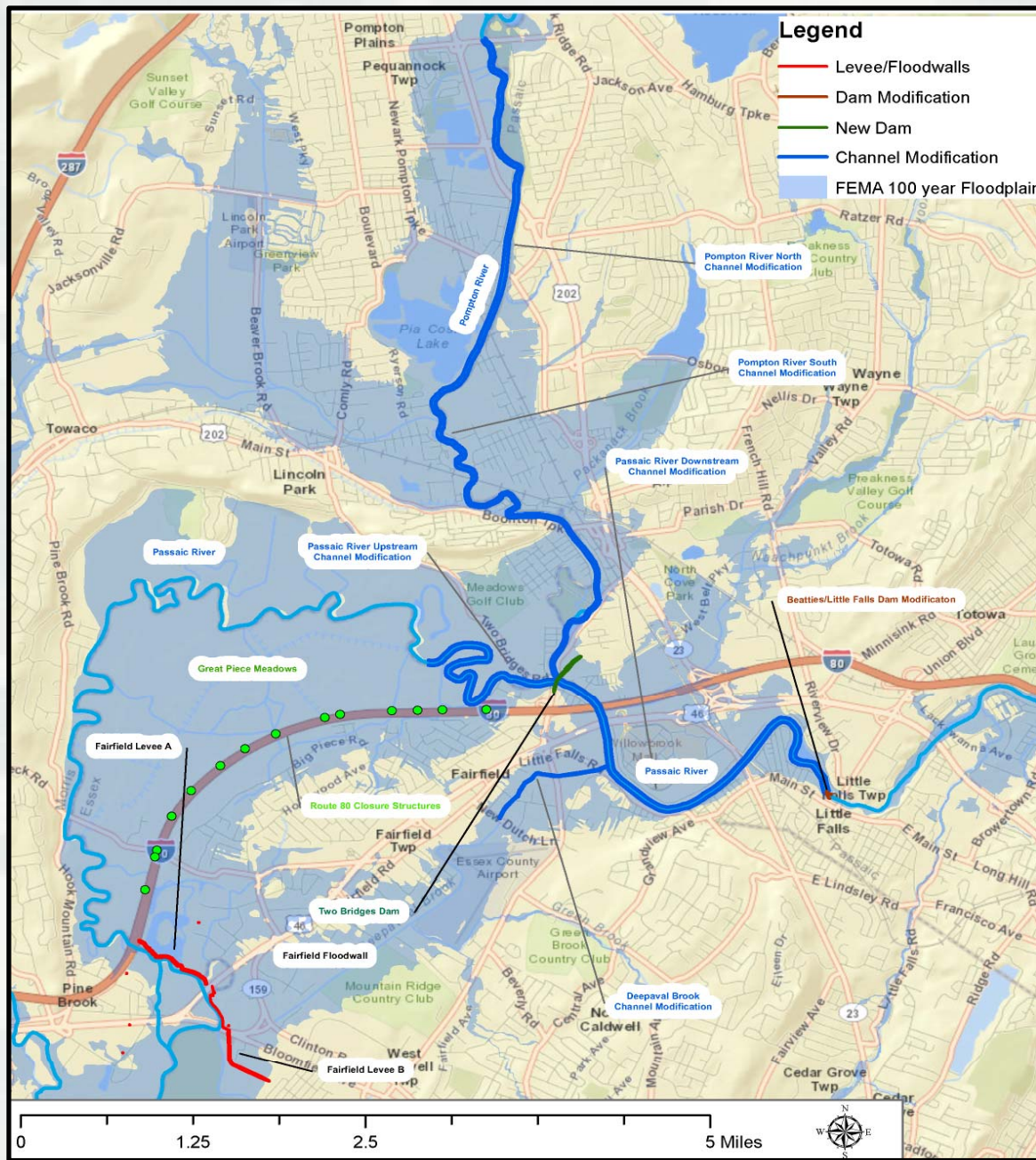


Dual Inlet – Newark Bay Outlet Tunnel Alternative

- 20 mile, 42 ft. dia. main diversion tunnel
- 1.2 mile, 23 ft. dia. spur tunnel
- 7 miles of channel improvements
- 7 miles of levees
- 13 miles of flood walls
- 17 ponding areas
- 15 pump stations

Risk:

- 1% exceedance throughout (100-year)



Beatties Dam & Two Bridges Alternative

- 13.1 miles of Channel Improvements
- 1.2 miles of Levees
- 0.4 miles of Floodwall
- New 25 foot high Two Bridges Dam
- Rebuild Beatties Dam to 580 feet long with the same crest elevation





10-year Non-Structural Alternative

Plan includes (structures):

- Floodproof 8,740
- Raise 646
- Ringwall 494
- Buyout 68

Non-structural total 9,947

Risk:

- 10% exceedance throughout (10-year)



Issues Identified During Phase 1

- Floods are more frequent and intense, what used to be a 100-year (1% probability of exceedance) flood is now roughly a 60-year (1.7% probability of exceedance)
 - ▶ Levees and flood walls may need to be higher
- Interior Drainage (drainage inside levees) not updated
- Levee foundation requirements & potential contamination not addressed
- Historic properties and natural resources (wetlands, etc.) impacts have not been evaluated



Change in Flood Depths when compared to 1995 Report Values at Little Falls

Return Period	Difference in feet
10-year	+ 1.6
100-year	+ 1.3
500-year	+ 1.1

Levees and floodwalls would have to increase 1 to 1.5 feet to contain the latest estimated 100 year event.



Summary of Phase 1

(1 of 2)

- Reviewed available existing data
- Updated hydrology model with FEMA data
- Supplemented 1995 hydraulics model with various current FEMA models
- Used cost indices to update tunnel cost
- Updated quantities of materials and costs for levees, floodwalls, and channels
- Confirmed Federal interest



Summary of Phase 1

(2 of 2)

- Virtual structural inventory of 11 out of 216 economic reaches
- Developed new alternative at request of local sponsor: Beatties Dam/Two Bridges
- Ran hydraulic models for four alternatives
- Identified properties that are participating in buyout programs
- Updated floodwalls and levees to current design standards
- Updated natural and cultural resources proposed mitigation costs



Preliminary Economic Screening Results

Alternative	Total Cost 1987	Total Cost 2013 ¹	Benefit-Cost Ratio 1987	Benefit-Cost Ratio 2013	Net Excess Benefits 2013 ⁴	Estimated Contamination Costs ³
*14A	\$876M	\$3.1B	1.06	0.8 – 1.2	(\$29,854,200) - \$18,463,300	Moderate
16A	\$1B	\$5.8B	1.1	0.5 – 0.7	(\$139,483,800) - (\$61,214,400)	Significant
*Newark Bay Outlet Tunnel	\$2.1B	\$4.7B	1.1	1.02 – 1.44	\$5,224,700 - \$68,698,300	Low
Beattie's Dam / Two Bridges	Not in 1987 GDM	\$1.9B	Not in 1987 GDM	0.6 – 0.80	(\$38,541,700) - (\$12,783,100)	Low
*Nonstructural (10-year LOP)	\$1.3B	\$1.2B	0.8	1.3-1.9 ²	\$14,887,600 - \$30,883,400	Low

*Alternatives selected for Phase 2 Detailed Analysis

-NJDEP formally notified USACE on 19 Feb 2014

-Phase 2 will bring these alternatives to an appropriate level of detail for a Tentatively Selected Plan

1. Costs for Alternative 16A and Beatties Dam /Two Bridges Alternative assume that excavated material dredged during channelization will be disposed (tipping fee) and not re-used for levee construction. Any contamination disposal would be funded by NJDEP
2. The 10yr non-structural plan benefits were evaluated as if it were a levee at the 10 year stage. Because flood-proofing is proposed for the vast majority of the buildings the overall damage reduction may be somewhat high. Further, there is no building specific data to use for this model (only 11 reaches (out of 216) were modeled). Non-structural damage reduction varied between 2% to 42% of the without project damage. This suggests that there *is uncertainty* in the estimated benefits.
3. Assumes all excavated material is contaminated and must be disposed, accordingly.
4. Net Excess benefits is the difference between the annualized cost and the annualized benefits



Comparison of Alternatives

Levees and Floodwalls	Diversion Tunnel	Non-Structural	No Action
•100-year level and 10-yr level	•100-year level	•10-year level	•2- to 5-year level
•High Cost	•Higher Cost	•Moderate cost	Annualized damages in excess of \$240 mil
•Provides comprehensive risk reduction	•Provides most comprehensive risk reduction	•Does not provide comprehensive risk reduction	•Does not provide comprehensive risk reduction
•High benefits during construction	•Low benefits during construction	•Highest benefits during construction	•No benefits
•Lowest performance if project is exceeded	•High performance if project is exceeded	•Low performance if project is exceeded	•No risk reduction
•No existing construction authorization	•Authorized but design and construction funding currently prohibited	•No existing construction authorization	•N/A
•Significant environmental impacts	•Significant environmental impacts	•Significant environmental impacts associated with flooding	•Significant environmental impacts associated with flooding



Conclusions

- All alternatives have uncertainty
- Predicted Flows (& Water Surface Elevations) have risen a moderate amount. (100-yr. is now about a 60-yr. design)
- Hurricane Katrina related design requirements increased costs
- The buyout analysis indicates that the current number of buy-outs has a negligible effect on the benefit-to-cost ratio
- Benefit to cost ratios indicate three alternatives have potential for positive economics
- Except for the Non-Structural Plan, benefit to cost ratios have not changed significantly
- No action plan results in excess of \$240 million in average annual equivalent flood damages



Goals of Phase 2

- Seek public consensus for one plan, in conjunction with NJDEP
- Perform necessary studies and data gathering to analyze the four alternatives (which includes no action)
- Select one plan for recommendation and develop cost estimate and schedule to construct the recommended plan
- Analyze the environmental impacts of the selected plan through an Environmental Impact Statement (NEPA)



Path Forward

- Complete public information sessions
- Proceed with Phase 2 studies with selected alternative(s), subject to receiving future funding
- Initiate NEPA Process



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COMMENTS

Name (optional): _____ Address _____

Affiliation/Location: _____

How is the best way to communicate with you? _____

Questions/Comments: _____ Email: _____

Additional information can be found at: www.nan.usace.army.mil/passaic
Comments or issues can also be submitted to: passaic_study@usace.army.mil

Preliminary Alternatives Analysis Report and electronic
comment card can be found at:
www.nan.usace.army.mil/passaic

